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Abstract of the national paper of Sweden

I. General

1. For Sweden, as for most other countries, international cooperation in space is a prerequisite for developing space activities. The publicly funded space activities in Sweden are mostly (about 80 per cent) carried out through international cooperation, mainly with the European Space Agency (ESA) and through bilateral cooperation. Sweden's participation in international and, in particular, European space cooperation is one condition for the development of space-related activities in Sweden.

2. The main goals of the Swedish space programme are to retain and develop to the highest level acquired expertise in various fields of activity and to make Sweden an interesting and competent partner for international scientific and industrial cooperation.

3. Key programme areas are magnetospheric and ionospheric research, astronomical studies, remote sensing, observation of the Earth's atmosphere and environment, and specialized industrial competence, including the development of small, cost-effective satellites.

4. The development and coordination of space activities in Sweden have been entrusted to the Swedish National Space Board, a governmental agency under the Ministry of Industry, Employment and Communications.

II. Space research

5. The Swedish space research programme is comprised of publicly financed basic research activities that involve the use of sounding rockets, balloons and satellites in experiments. The main areas of the programme are classical space research and research in microgravity. Swedish space research encompasses large areas of modern physics such as astronomy, plasma physics, atmospheric physics, material physics, biophysics and fundamental physics.

6. Thanks to its position at a high northern latitude (68° N), Esrange is particularly well suited to observing the aurora and other high latitude phenomena and to receiving data from and tracking and controlling satellites in polar orbits. Esrange is operated by the State-owned company Swedish Space Corporation (SSC). Esrange is very suitable for all sounding rocket experiments that involve recovery, for instance for microgravity research.

III. Small satellites

7. The series of small cost-effective scientific satellites, such as Viking, Freja, Odin (launch planned for 1999) and Astrid 1, with control and data reception at Esrange, as well as the launching of sounding rockets and balloons constitute the backbone of the Swedish national space research programme. The most recently launched microsatellite Astrid 2 (launched in December 1998) is controlled by a newly developed, efficient semi-automatic control station at SSC headquarters in Solna.

IV. Earth observation

8. Swedish remote sensing activities are carried out primarily in cooperation with France (Satellite pour l'observation de la Terre (SPOT)) and within framework of ESA programmes, the European Commission and the Committee on Earth Observation Satellites. The main goals of Sweden's Earth observation activities are to support research and technology, to secure the continuity of global data and to promote the use of information from satellites for applications in society, particularly for environmental monitoring, forestry, meteorology and topographic mapping.

9. Sweden has increased its capacity to contribute to global environmental programmes through the satellite project Odin, the establishment of the Environmental Satellite Data Centre (MDC) in Kiruna and its participation in the Centre for Earth Observation within the framework of the European Community.

V. Transfer of knowledge: remote sensing courses

10. Sweden has acquired broad experience in remote sensing and geographic information systems at governmental agencies, universities and companies. This experience and know-how can be made available to developing countries where there is a need for mapping and other remote sensing applications. Thus, there is an increasing demand for the transfer of technology in the form of training personnel from developing countries. For that purpose, the Swedish Institute for Geographical Information Technology was established in Kiruna. The Institute offers training courses in practical applications of remote sensing.

11. The annual United Nations Training Course on Remote Sensing Education for Educators is carried out jointly by the Department of Physical Geography of Stockholm University and SSC Satellitbild in Kiruna. The main objectives of the course are to develop practical knowledge and skills in remote sensing technology among educators from developing countries and to enable them to introduce the discipline into the educational programmes in their own countries.

VI. Industrial development

12. The industrial development programme is aimed at developing technical know-how in the field of space in order to promote industrial competiveness and to support Swedish companies in the field of space. Sweden does most of this by participating in ESA programmes. There are three main space companies in Sweden: SSC, Saab Ericsson Space AB and Volvo Aero Corporation.

VII. Kiruna: a Swedish space centre

13. The town of Kiruna was chosen for conducting space activities because of its location in the auroral zone near the North Pole. The following institutes in the field of space activities are located in Kiruna: Esrange, the Swedish Institute of Space Physics (IRF), SSC Satellitbild, MDC and the Environment and Space Research Institute (MRI).

VIII. Further information

14. Further information on space-related activities in Sweden may be obtained from the following:

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